

Why Isn't the Whole World Developed?

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*Why Isn't the Whole World Developed?*²

RICHARD A. EASTERLIN

The worldwide spread of modern economic growth has depended chiefly on the diffusion of a body of knowledge concerning new production techniques. The acquisition and application of this knowledge by different countries has been governed largely by whether their populations have acquired traits and motivations associated with formal schooling. To judge from the historical experience of the world's twenty-five largest nations, the establishment and expansion of formal schooling has depended in large part on political conditions and ideological influences. The limited spread of modern economic growth before World War II has thus been due, at bottom, to important political and ideological differences throughout the world that affected the timing of the establishment and expansion of mass schooling. Since World War II there has been growing uniformity among the nations of the world, modern education systems have been established almost everywhere, and the spread of modern economic growth has noticeably accelerated.

With the coming of the modern age formal education assumed a significance far in excess of anything that the world had yet seen. The school, which had been a minor social agency in most of the societies of the past, directly affecting the lives of but a small fraction of the population, expanded horizontally and vertically until it took its place along with the state, the church, the family and property as one of society's most powerful institutions.

George S. Counts¹

IT is now a full two centuries since the coming of the modern technological age was signalled by James Watt's invention of the single acting steam engine. In this period output per capita and per unit of labor input have risen at long-term rates never before seen in human history—first in northern and western Europe and Northern America, subsequently

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¹ *Encyclopedia of the Social Sciences* (New York, 1931), vol. V, p. 410.

in Japan, southern and eastern Europe, and parts of Latin America and Oceania.² So great is the contrast with prior experience that it has led Simon Kuznets to designate this period as a new epoch in world history, the epoch of modern economic growth.³ Yet, after two centuries, the great majority of the world's population continues to live in conditions not much different from those at the start of this epoch.

Given the startling contrasts in national experience, an objective look at the history of the past two centuries would not, I think, place in the foreground the questions that now dominate the study of economic history. The current preoccupation of Western scholars with American and European—largely northwestern European—economic history can only seem provincial, for the striking feature about these areas is the fundamental similarity in their experience. Rather, the foremost question of modern economic history, the one that challenges explanation, is why the spread of economic growth has been so limited: why isn't the whole world developed? Beyond this, there is the question of the future: *will* the whole world become developed? If so, how soon? What is the outlook for the "epoch of modern economic growth"?

No one can pretend to know the answers to these questions—but it is worth talking about them, if only to build a case for redirection of research in economic history. Let us begin with the question about the past: why has the spread of economic growth been so limited?

I

The heart of the whole process of industrialization and economic development is intellectual: it consists in the acquisition and application of a corpus of knowledge concerning technique, that is, ways of doing things.

David Landes⁴

In thinking about the past, let us imagine, to start with, a world not unlike that of the late eighteenth century—a world of low and roughly equal levels of economic productivity everywhere, and with fairly limited international contacts through trade, migration, and investment. Suppose now that in one nation economic productivity starts rising rapidly and steadily, because of an unprecedented rate of technological progress. Before long, a second nation sets off on a similar course as technological change also accelerates dramatically, and, then, a third. After a century or so, the total number of nations so embarked remains—on a worldwide scale—small, though increasing.

Consider now a few implications of this development. In the course of

² Richard A. Easterlin, "Economic Growth: Overview," *International Encyclopedia of the Social Sciences* (New York, 1969), vol. IV, pp. 395–408.

³ *Modern Economic Growth: Rate, Structure and Spread* (New Haven, 1966), chap. 1.

⁴ "The Creation of Knowledge and Technique: Today's Task and Yesterday's Experience," *Daedalus*, 109 (Winter 1980), 111.

time, large and growing disparities would emerge between income levels in those nations enjoying the fruits of rapid technological progress and those that are not. International trade and investment would expand greatly as a result of sharp shifts in comparative advantage caused by differential technological progress, and also because international transfer costs would fall substantially if, as seems likely, those nations benefiting from new technology apply it to problems of international as well as domestic transport. The resulting increased flow of goods and resources internationally would have some beneficial effect on income levels generally, but such effects would be relatively small compared with the dominating effect on income levels of major differences in the rate of technological change.

This, I suggest, is the essence of what has occurred in the past two centuries.⁵ During this period international income differences have grown at unprecedented rates, as have foreign trade and investment. The prime mover in this drama has been the sharp acceleration in the rate of technological change in a relatively small number of nations.

If this view is correct, then it follows that explaining why modern economic growth has spread so slowly becomes a question of explaining why rapid technological change has been limited to so few nations. To answer this, one must first consider whether rapid technological change, when it occurred, was based on a new technology in each country that was indigenous or borrowed. On this, the view that a common technology diffused from one country to the next is certainly the more realistic one. This is evidenced by the classic studies of W. O. Henderson and David Landes of the spread of industrial technology in Europe; in the accounts of the modernization of Japan by scholars such as Tuge and Saxonhouse; and in Strassman's studies of contemporary experience.⁶ It is evidenced as well by the striking likeness of modern industrial technology among the various high productivity nations themselves. Only in regard to agriculture, where local environmental conditions play an important part in produc-

⁵ For similar views see Kuznets, *Growth*; Rondo Cameron, "The Diffusion of Technology as a Problem in Economic History," *Economic Geography*, 51 (July 1975), 217-30; William N. Parker, "Economic Development in Historical Perspective," *Economic Development and Cultural Change*, 10 (Oct. 1961), 1-7; William Woodruff, *Impact of Western Man* (New York, 1967); Paul Bairoch, *The Economic Development of the Third World since 1900* (Berkeley and Los Angeles, 1975); John Robert Hanson, *Trade in Transition: Exports from the Third World, 1840-1900* (New York, 1980); William Ashworth, *A Short History of the International Economy, 1850-1950* (London, 1952). A valuable framework for the study of international political development is presented in Stein Rokkan, "Dimensions of State Formation and Nation Building: A Paradigm for Research on Variations within Europe," in Charles Tilly, ed., *The Formation of National States in Western Europe* (Princeton, 1975), pp. 562-600.

⁶ William O. Henderson, *Britain and Industrial Europe*, 3d ed. (Leicester, 1972); David S. Landes, *The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present* (Cambridge, 1969); Hideomi Tuge, ed., *Historical Development of Science and Technology in Japan* (Tokyo, 1961); Gary Saxonhouse, "A Tale of Japanese Technological Diffusion in the Meiji Period," this JOURNAL, 34 (March 1974), 149-65; W. Paul Strassman, *Risk and Technological Innovation* (Ithaca, 1959).

tion, might one hesitate to stress the borrowed over indigenous elements in modern technological change. But even in agriculture, one finds that many of the principles of modern technology, such as irrigation, seed selection, livestock breeding, fertilizer, and, more recently, development of hybrids and use of pesticides, exhibit quite similar features among nations. Thus it seems reasonable to conclude that the question of explaining differential technological change among nations in the modern period is a matter chiefly of explaining the limited diffusion of a common technology.

Much of the research on technological diffusion has been admirably synthesized and critiqued by Nathan Rosenberg.⁷ One strong impression that emerges from reading this literature is the extent to which the transfer of technology is a person-to-person process. As Rosenberg points out, "the notion of a production function as a 'set of blueprints' comes off very badly . . . if it is taken to mean a body of techniques which is available *independently* of the human inputs who utilize it."⁸ According to Svernillson, "much of the detailed knowledge that is born in the course of industrial operations, can more easily and in part exclusively be transferred by demonstration and training in actual operations."⁹ Similarly, to Arrow, "it seems to be personal contact that is most relevant in leading to . . . adoption [of an innovation]."¹⁰

This emphasis on the personal element in the transfer of technology suggests that understanding of it might usefully be approached by analogy with a situation in which most of us here have some relevant experience, namely, as an educational process, in which a new and difficult subject—"modern" technology—must be taught and learned. From this point of view, explanation of the limited spread of modern economic growth turns into a question of identifying the factors that have constrained the dissemination of a new type of knowledge—that of modern technology.

II

Education produces large, pervasive, and enduring effects on knowledge and receptivity to knowledge.

Herbert H. Hyman et al.¹¹

⁷ Nathan Rosenberg, "Factors Affecting the Payoff to Technological Innovation," unpublished document prepared for the National Science Foundation (1974). See also David J. Teece, *The Multinational Corporation and the Resource Cost of International Technology Transfer* (Cambridge, MA, 1976).

⁸ Nathan Rosenberg, "Economic Development and the Transfer of Technology: Some Historical Perspectives," *Technology and Culture*, 11 (Oct. 1970), 555, emphasis added.

⁹ Ingvar Svernillson, "Technical Assistance: The Transfer of Industrial Know-how to Non-Industrialized Countries," in Kenneth Berill, ed., *Economic Development with Special Reference to East Asia* (New York, 1964), p. 408, emphasis in original.

¹⁰ Kenneth J. Arrow, "Classification Notes on the Production and Transmission of Technological Knowledge," *American Economic Review: Papers and Proceedings*, 52 (May 1969), 33; see also Daniel Lloyd Spencer, *The Technological Gap in Perspective* (New York, 1970).

¹¹ Herbert H. Hyman, Charles R. Wright, and John Shelton Reed, *The Enduring Effects of Education* (Chicago, 1975), p. 109.

Viewing the transfer of technology as an educational process leads naturally to questions about teachers and students. If new technological knowledge spread slowly, did the fault lie on the teachers' side or the students'?

One reason for minimizing the teachers' responsibility is that when entrepreneurs or governments in low productivity nations wanted teachers, they seem to have been able to beg, borrow, buy, or steal them, as well as send their nationals to the high productivity nations for instruction. After the Meiji Restoration, for example, Japan imported numerous foreign scholars and technological experts and sent students to the West.¹²

The more important question lies on the side of the students. What is it that makes for effective learning? Learning is, as we all know, partly a matter of inherent intelligence; partly of aptitudes; and partly of incentives. What we all seek are bright, well-trained, and highly motivated students.

I think we can safely dismiss the view that the failure of modern technological knowledge to spread rapidly was due to significant differences among nations in the native intelligence of their populations. To my knowledge there are no studies that definitively establish differences, say, in basic IQ among the peoples of the world.

A more persuasive case might be made with regard to incentives for learning; institutional differences among countries undoubtedly created variations in the incentives for mastering the new technology. In their studies of the historical development of property and other institutions, Jonathan Hughes, Douglass North, Robert Thomas, and others are, in this respect, filling an important gap in knowledge about incentive structures.¹³ But it is important to recognize that the new technology itself created incentives for learning via the competitive pressures exerted through international trade. Thus the rapid response by producers in parts of Continental Europe and the United States to the British industrial revolution was partly induced by the growing flood of imported British manufactures in their markets. The new technology also created pressures for its more widespread adoption by endowing its possessors with superior military capability. The threat to political sovereignty thus posed was a strong incentive for governments in low productivity countries to initiate and promote programs of technological modernization, as in Japan. In the course of time such economic and political pressures were felt in many nations throughout the world; yet often the new technology failed to be taken up. The question is, why?

The answer, I suggest, has to do in important part with differences

¹² Tuge, *Science*; for early data on Japanese students studying abroad, see Reinhold Schairer, *Die Studenten im internationalen Kulturleben: Beiträge zur Frage des Studiums in fremdem Lande* (Münster in Westfalen, 1927), chap. 1. See also Henderson, *Europe*.

¹³ Douglass C. North and Robert Paul Thomas, *The Rise of the Western World: A New Economic History* (Cambridge, 1973); Jonathan R. T. Hughes, *Social Control in the Colonial Economy* (Charlottesville, 1976).

among countries in the extent of their population's formal schooling: the more schooling of appropriate content that a nation's population had, the easier it was to master the new technological knowledge becoming available. Moreover, as I shall note subsequently, substantial increases in formal schooling tend to be accompanied by significant improvement in the incentive structure. Hence increased motivation often accompanied increased aptitudes for learning the new technology.

The notion that learning potential depends on prior education should come as no surprise here, for it is a guiding principle in most schools and colleges. Given intelligence and motivation, one prefers students with better academic records from better schools, and with more training in relevant subjects. If one's concern is to explain why some nations were rapid learners and others slow, it seems only reasonable to ask what sort of differences there were in the educational systems that prepared their populations for acquiring new knowledge.

As a first step toward establishing the facts, Figure 1 presents historical data for twenty-five of the largest countries of the world—in 1960 they accounted for over three-fourths of the world's population—on a very crude indicator of educational development, the primary school enrollment rate. These countries, I believe, are reasonably illustrative of experience more generally.¹⁴ The primary school enrollment rate at any date is simply the number enrolled in primary school per 10,000 total population. It is subject to both conceptual and measurement biases, most notably to variations in the proportion of school age population to the total.¹⁵ It can, however, reasonably be taken as an index of differences among nations and trends over time in their population's exposure to formal schooling. Roughly speaking, values less than 400 signify relatively little exposure of a nation's population to formal schooling; values in the 400–800 range, a moderate exposure; and values greater than 800, substantial. To facilitate comparisons among countries in the figure, the section of each graph bracketed by an enrollment rate of zero to 400 in the period through 1940 has been shaded. Differences among countries in peak values and the trend in these values are of little analytical significance because they reflect chiefly variations in the proportion of school age population. For this reason, and to reduce confusion in the figure, a country's curve was not plotted after it reached a fairly high level.¹⁶

¹⁴ The countries chosen were those with 1960 populations greater than 18 million. Because of insufficient historical data, Poland, Pakistan, and Viet Nam are omitted.

¹⁵ Among other comparability problems are the occasional use of attendance rather than enrollment data, variations in the time of year for which enrollment is reported, differences in the length of the school day and school year, and differences in schools included in the "primary" category (e.g., kindergartens).

¹⁶ For other studies of enrollment rates see UNESCO, *World Survey of Education*, vol. 2 (New York, 1958), pp. 42–60; Alexander L. Peaslee, "Education's Role in Development," *Economic Development and Cultural Change*, 17 (April 1969), 293–318. Although enrollment is used here in preference to literacy because it is a more reliable indicator of the expansion of formal mass schooling, valuable work has been done to develop historical literacy data. See Peter Flora, "Historical Processes

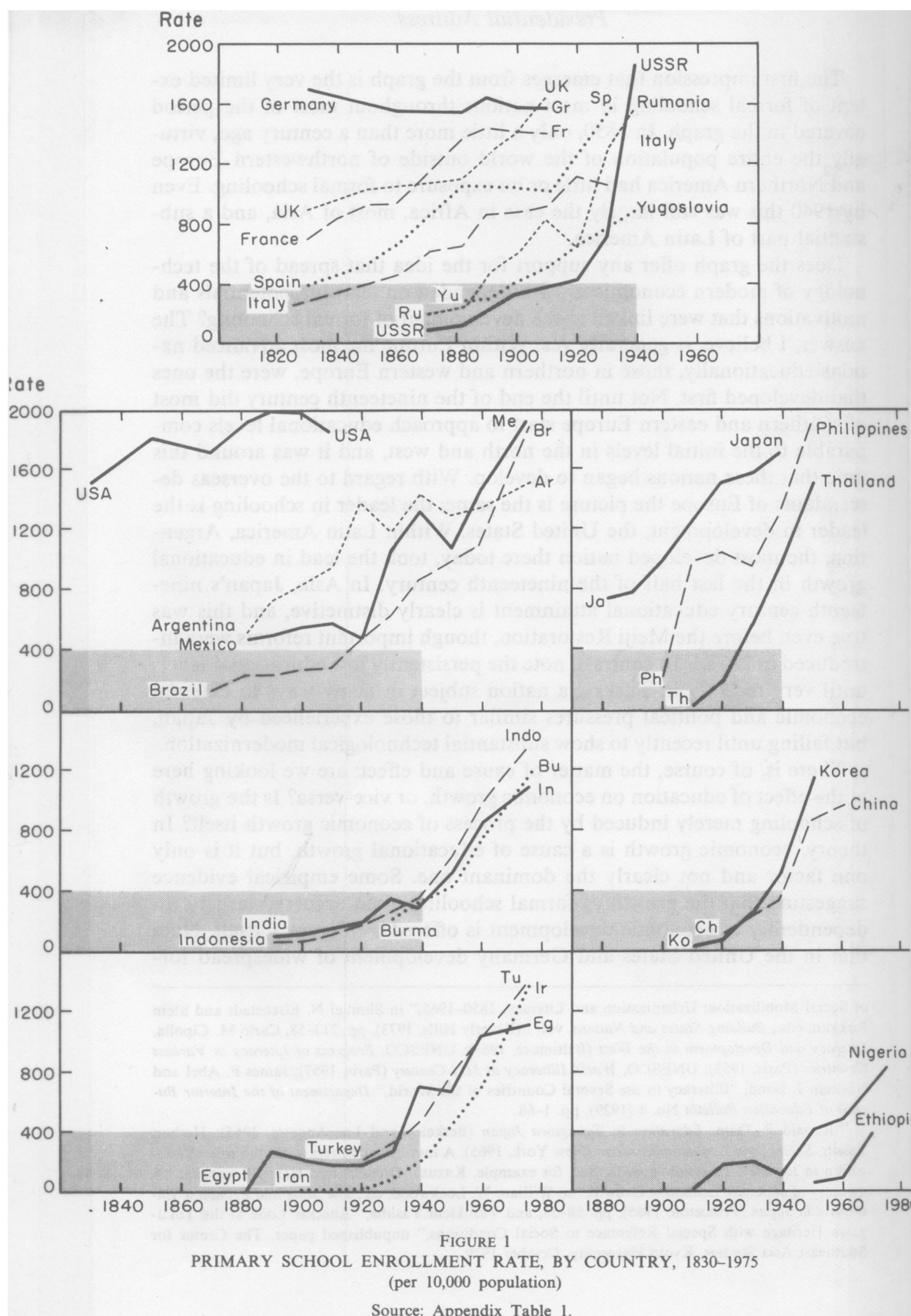
The first impression that emerges from the graph is the very limited extent of formal schooling in most nations throughout most of the period covered in the graph. In 1850, only a little more than a century ago, virtually the entire population of the world outside of northwestern Europe and Northern America had little or no exposure to formal schooling. Even by 1940 this was still largely the case in Africa, most of Asia, and a substantial part of Latin America.

Does the graph offer any support for the idea that spread of the technology of modern economic growth depended on learning potentials and motivations that were linked to the development of formal schooling? The answer, I believe, is generally yes. Within Europe the most advanced nations educationally, those in northern and western Europe, were the ones that developed first. Not until the end of the nineteenth century did most of southern and eastern Europe start to approach educational levels comparable to the initial levels in the north and west, and it was around this time that these nations began to develop. With regard to the overseas descendants of Europe the picture is the same: the leader in schooling is the leader in development, the United States. Within Latin America, Argentina, the most developed nation there today, took the lead in educational growth in the last half of the nineteenth century. In Asia, Japan's nineteenth-century educational attainment is clearly distinctive, and this was true even before the Meiji Restoration, though important reforms were introduced in 1872.¹⁷ In contrast, note the persistently low educational levels until very recently in Turkey, a nation subject in many ways to external economic and political pressures similar to those experienced by Japan, but failing until recently to show substantial technological modernization.

There is, of course, the matter of cause and effect: are we looking here at the effect of education on economic growth, or vice-versa? Is the growth of schooling merely induced by the process of economic growth itself? In theory, economic growth is a cause of educational growth, but it is only one factor and not clearly the dominant one. Some empirical evidence suggesting that the growth of formal schooling often occurred largely independently of economic development is offered by Figure 1 itself. Note that in the United States and Germany development of widespread for-

of Social Mobilization: Urbanization and Literacy, 1850–1965,” in Shmuel N. Eisenstadt and Stein Rokkan, eds., *Building States and Nations*, vol. I (Beverly Hills, 1973), pp. 213–58; Carlo M. Cipolla, *Literacy and Development in the West* (Baltimore, 1969); UNESCO, *Progress of Literacy in Various Countries* (Paris, 1953); UNESCO, *World Illiteracy at Mid-Century* (Paris, 1957); James F. Abel and Norman J. Bond, “Illiteracy in the Several Countries of the World,” *Department of the Interior Bureau of Education Bulletin* No. 4 (1929), pp. 1–68.

¹⁷ Ronald P. Dore, *Education in Tokugawa Japan* (Berkeley and Los Angeles, 1965); Herbert Passin, *Society and Education in Japan* (New York, 1965). A number of writers stress the role of education in Japanese economic growth. See, for example, Kazushi Ohkawa and Henry Rosovsky, “A Century of Japanese Economic Growth,” in William W. Lockwood, ed., *The State and Economic Enterprise in Japan* (Princeton, 1965), pp. 58–59, and Yasukichi Yasuba, “Another Look at the Tokugawa Heritage with Special Reference to Social Conditions,” unpublished paper, The Center for Southeast Asia Studies, Kyoto University, October 1979.



mal schooling clearly preceded the onset of modern economic growth. Note, too, that for a number of countries the schooling curves show abrupt upswings that are not matched by concurrent surges in economic development—examples are Rumania between 1880 and 1910; the Philippines between 1900 and 1920; and Mexico and Thailand between 1920 and 1940.

Even if one were to agree that in a general way theory and evidence are consistent with the notion that formal schooling fosters attributes in a population that are conducive to the acquisition of modern technology, there remain important questions about the type of schooling and attributes. Is it true, for example, that “the spread of technological knowledge, narrowly considered, is not a matter of mass education, but of the training of a small elite”?¹⁸ If mass education is important, does it have its effect via training in functional skills such as “the three R’s,” through “screening,” or via political socialization, either of a broad sort, or more narrowly, in instilling a discipline appropriate to factory work?¹⁹ Or is the function of education, as some sociological studies suggest, one chiefly of creating a basic change in human personality—a “modern man” who acquires aspirations and attitudes especially favorable to the adoption of new technology?²⁰ According to these studies even a small amount of formal schooling has an effect of this sort, although the greater the amount of schooling the greater the effect.²¹

¹⁸ William N. Parker, “Perspective,” p. 1. For valuable discussions of some of the issues in this paragraph see C. Arnold Anderson and Mary Jean Bowman, eds., *Education and Economic Development* (Chicago, 1965); C. Arnold Anderson and Mary Jean Bowman, “Education and Economic Modernization in Historical Perspective” and Lawrence Stone, “Introduction,” both in Lawrence Stone, ed., *Schooling and Society* (Baltimore, 1976), pp. xi-xvii, 3-19; Mary Jean Bowman and C. Arnold Anderson, “Concerning the Role of Education in Development,” and Martin Carnoy, “Education and Economic Development: The First Generation,” *Economic Development and Cultural Change: Essays in Honor of Bert F. Hoselitz*, 25 (Supplement, 1977), 428-48; Frederick Harbison and Charles A. Meyers, *Education, Manpower, and Economic Growth* (New York, 1964); Cameron, “Diffusion”; The World Bank, *World Development Report* (Washington, D. C., 1980), chap. 5.

¹⁹ James S. Coleman, ed., *Education and Political Development* (Princeton, 1965); Samuel Bowles and Herbert Gintis, *Schooling in Capitalist America* (New York, 1976); Martin Carnoy, *Education as Cultural Imperialism* (New York, 1974); Robert Dreeben, *On What Is Learned in School* (Reading, MA, 1968); Philip Foster, *Education and Social Change in Ghana* (Chicago, 1965); Harvey J. Graff, *The Literacy Myth* (New York, 1979); Michael B. Katz, *Class, Bureaucracy, and Schools* (New York, 1971).

²⁰ Alex Inkeles and David H. Smith, *Becoming Modern* (Cambridge, 1974); Alex Inkeles, “The School as a Context for Modernization,” *International Journal of Comparative Sociology*, 14, no. 3-4 (Sept.-Dec. 1973), 163-79; David C. McClelland, “Does Education Accelerate Economic Growth?” *Economic Development and Cultural Change*, 14 (April 1966), 257-78; William Form, “Comparative Industrial Sociology and the Convergence Hypothesis,” *Annual Review of Sociology*, 5 (1979), 1-25.

²¹ Inkeles and Smith, *Becoming Modern*, chap. 9. Formal education is, to be sure, not the only institution to create modern men; some of the new economic institutions accompanying modern economic growth—most notably, the factory—also work in this way. Thus, there is the possibility of growth “by pulling up on one’s own bootstraps”—factories once established create personality changes conducive to further economic growth. But the population exposed to factory experience is much more limited than that potentially reached by a formal school system. Moreover, the evidence indicates that the impact of formal schooling in creating the personality traits of “modern man” is much greater than that of any other institution—more than twice as great, for example, as that of the next most important institution, the factory.

The present state of knowledge does not, I think, provide satisfactory answers to what types of education have what specific effects on economic growth, and clearly the answers need not be mutually exclusive. It seems likely, however, that a substantial primary education system is essential for sustained economic growth. The reason for this is clear if one contrasts the process of achieving higher income levels with that of raising life expectancy. Thanks to modern public health and medical technology, it has proven possible to improve life expectancy markedly even among large populations through measures such as use of pesticides, water purification, and establishment of sewage systems that require knowledge and action by only a relatively few technologists. In contrast, raising productivity levels involves active participation in new production methods by large numbers of the population—by workers in agriculture, industry, transportation, and so on. This is not to say that secondary and higher education can be ignored; clearly one needs technologists as well as mass education. But increases at higher levels of education typically go together with the expansion of primary education.²² On the other hand, education of the elite without mass education is unlikely to foster economic growth.²³

It also seems that the content of education conducive to economic growth is that of a secular and rationalistic type. While such content has usually characterized an expansion in mass education, this has not always been true. Among the countries in Figure 1, Spain stands out as a country whose rate of educational development seemingly exceeded its economic growth. A closer look at Spanish education, however, reveals that until the twentieth century it remained closely controlled by the Roman Catholic Church: “the children of the masses received only oral instruction in the Creed, the catechism, and a few simple manual skills. . . . [S]cience, mathematics, political economy, and secular history were considered too controversial for anyone but trained theologians.”²⁴ One consequence of this is that literacy in Spain fails to show an increase commensurate with what one might expect from the data on primary school enrollment; even by 1900 almost two thirds of the population remained illiterate.

III

It is necessary that we enter into a new phase of the Revolution which I shall call the psychological revolutionary period; we must enter into and take possession of the minds of children, the consciences of the young, because they do belong and should belong to the

²² For example, for 90 countries in the period 1970-74, the adjusted R^2 between primary and secondary enrollment rates is .51; between primary and higher, .41. Data are from UNESCO, *Statistical Yearbook*, 1976 (Paris, 1977).

²³ In the nineteenth century, educational modernization in the Ottoman Empire, to the extent it occurred, stressed education of the elite; see Andreas M. Kazamias, *Education and the Quest for Modernity in Turkey* (Chicago, 1966). The 1950s data for India presented by Harbison and Meyers suggest a disproportion of secondary and higher education relative to primary (*Manpower*, p. 47).

²⁴ I. N. Thut and Don Adams, *Educational Patterns in Contemporary Societies* (New York, 1964), p. 62.

Revolution. . . . It is absolutely necessary to drive the enemy out of that entrenchment where the clergy has been, where the Conservatives have been—I refer to Education.

Mexican General and ex-President Plutarco Calles, 1934²⁵

In simplest terms, the argument to this point is that the spread of the technology underlying modern economic growth depended in large part on the extent to which the populations in different countries had acquired appropriate traits and motivation through formal schooling. But even if the plausibility of this view be tentatively granted, it only leads to a more fundamental question: how can one explain the immense differences among the countries of the world in the timing and growth of formal education?

If, to answer this question, one follows the approach of the new economic history, then the appropriate guidelines are those currently offered by economic theory. This theory centers on decision-making in one social institution, the family, and sees the expansion of schooling as a voluntary response to growing payoffs to education generated by economic growth. Government, if it comes into the picture at all, is seen largely as implementing or ratifying private household decisions through public action.

There can be no question that serious research on economic incentives should form a part of research into the causes of expansion of mass education.²⁶ But the seemingly sizable payoffs to child labor that prevailed in many developed countries in certain phases of their modern economic history should caution against expecting too much from it. Research is needed also on motives and decisions affecting education by social institutions other than those relating to the family. Education is, as we are all aware, a powerful instrument for influencing the minds of individuals in their formative years; indeed, if we did not believe this, I doubt that most of us would be doing as professionals what we are now doing. This elementary fact has hardly escaped the attention of those in society interested in obtaining or maintaining political, social, and economic power.²⁷ The result has been that the establishment and growth of mass education has often been the product chiefly not of market forces but of political conflict in which major groups in a culture—groups that frequently vary from one society to the next—are ranged against each other. At the risk of oversimplification, let me try to illustrate this point in terms of Figure 1.

The most obvious shift in political power with which growth of mass education has been linked is the establishment of independence from a former colonial power. This is suggested by the histories of a number of

²⁵ As quoted in J. Lloyd Mecham, *Church and State in Latin America* (Durham, NC, 1934), p. 406.

²⁶ See, for example, David Mitch, "The Impact of a Growing Demand of Literate Workers on the Spread of Literacy in Nineteenth Century England," presented at the Workshop in Economic History, University of Chicago, no. 7980-2 (Oct. 1979).

²⁷ This has been explicitly recognized in recent economic history research. See, e.g., Alexander James Field, "Economic and Demographic Determinants of Educational Commitment: Massachusetts, 1855," this JOURNAL, 39 (June 1979), 439-57.

countries in southeastern Europe in the period prior to World War I (exemplified in Figure 1 by Rumania and Yugoslavia), in the mid-East in the 1920s and 30s (as illustrated by Egypt), and in Asia and Africa after World War II (see India, Indonesia, Burma, and Nigeria).²⁸ This observation implies that colonialism was a major deterrent to the growth of mass education, and thus lends support to the “imperialism” explanation for underdevelopment. Detailed empirical studies of colonial policy such as that currently in progress for the United Kingdom by Lance E. Davis and Robert Huttenback are needed to pursue this issue.²⁹ But the data in Figure 1 suggest reasons against a too hasty generalization of this sort. First, there are cases—though not many—where colonial governments promoted mass education. The clearest illustration is the American takeover of the Philippines from Spain; perhaps another example is Japanese policy in Korea.³⁰ Second, in Latin America decolonization in the nineteenth century was not followed by a great upsurge in mass education; hence colonialism cannot be the scapegoat there. Third, there is the counterfactual issue: in the absence of colonial rule would mass education have been promoted vigorously by independent governments? It is noteworthy that the historical record for Iran and Turkey in Figure 1 does not differ clearly from that for Egypt; and that the same is true of the record for China compared with India, and of Ethiopia vis-à-vis Nigeria. Even a casual glance at historical experience makes clear the need to consider other factors that have impeded mass education besides colonialism.

One factor that comes quickly to mind is absolute monarchy. The independent countries I have just mentioned—Turkey, Iran, China, and Ethiopia—were all absolute monarchies, and in none of these did a substantial trend toward mass education set in until after autocratic rule was terminated. To judge from Figure 1 the same is true of Russia and Thailand. Absolute monarchs seem usually to have regarded mass education as potentially subversive of their power; in contrast, communist governments have vigorously promoted mass education as an instrument of political socialization.³¹

Another deterrent to mass education appears to have been a situation in which the Roman Catholic Church exercised substantial secular power. This has already been touched on in the case of Spain; in Latin America, it is perhaps the dominant factor. The rapid rise in mass education in Ar-

²⁸ Flora notes the close association in a number of countries between the date of independence and the date when compulsory education was established. See Flora, “Mobilization,” pp. 230–37.

²⁹ Lance E. Davis and Robert A. Huttenback, “Public Expenditures and Private Profit: Budgetary Decisions in the British Empire, 1860–1912,” *American Economic Review*, 67 (Feb. 1977), 282–88.

³⁰ Carl H. Landé, “The Philippines,” in James S. Coleman, ed., *Political Development*, pp. 313–52; Shinkichi Etō, “Asianism and the Duality of Japanese Colonialism, 1879–1945,” in L. Blussé, H. L. Wesseling, and G. D. Winus, eds., *History and Underdevelopment* (Paris, 1980); Andrew J. Grajdanzev, *Modern Korea* (New York, 1944).

³¹ On Russia and the USSR, see Nicholas Hans, *History of Russian Educational Policy, 1701–1917* (New York, 1964), p. 65, and Jeremy R. Azrael, “Soviet Union,” in Coleman, ed., *Political Development*, pp. 233–71.

gentina after 1880 and in Mexico after 1920 both occurred in conjunction with a substantial shift in power from church to state.³² In the Middle East, Islam frequently appears to have been a negative influence in the development of formal schooling.³³

For the countries where mass education was already fairly well established by the early nineteenth century—represented in Figure 1 by Germany, England, France, and the United States—sufficient data are not available for analyzing the historical patterns of growth. One can ask, however, what set these countries apart from the rest of the world so early and contributed to their relatively high levels of schooling? Three influences stand out in the literature—Protestantism, humanism, and central government efforts at national integration. One of the main tenets of early Protestant thought, as shaped by leaders like Calvin and Luther, was that “the eternal welfare of every individual depends upon the application of his own reason to the revelation contained in the Scriptures”; in practice, this led to advocacy of formal schooling in the vernacular language so that each individual would have personal access to the Bible.³⁴ Humanism, which reached fullest expression with the philosophers of the eighteenth-century Enlightenment, preached the ultimate perfectibility of humanity and thus also fostered a view favorable to mass education.³⁵ Finally, some governments saw in mass education a means of securing allegiance to the central government at the expense of local authorities or the church.

The weight of these influences differed from country to country and not all operated in each. The role of Protestantism was strongest in Germany and the United States, weaker in England where the established Protestant religion was an Anglican version of Roman Catholicism and the vigorous proponents of education were the non-conformists; and weakest of all in France, which was predominantly Roman Catholic, although the separation of church and state was achieved fairly early. Humanism was strongest in France³⁶ and the United States, perhaps somewhat less so in England, and least influential in Germany. Nationalism and national in-

³² Mecham, *Church*, pp. 245–47, 376–77, 388–93. In Brazil, however, the church does not seem to have played as critical a role in the growth of mass education; there a shift in political control from conservatives to liberals appears to have been more important. See E. Bradford Burns, *A History of Brazil* (New York, 1970), pp. 290, 302–03.

³³ On Turkey, see Kazamias, *Turkey*, pp. 73–74; Iran, Hafez Farman Farmayan, “The Forces of Modernization in Nineteenth Century Iran: A Historical Survey,” in William R. Polk and Richard L. Chambers, eds., *Beginnings of Modernization in the Middle East* (Chicago, 1968), p. 123. In Egypt, Islam seems to have been less of an obstacle to educational change; see P. J. Vatikiotis, *The Modern History of Egypt* (New York, 1969), pp. 69–70.

³⁴ Paul Monroe, *A Text-Book in the History of Education* (London, 1907), p. 407. Japan seems to have had its own version of the “Protestant ethic”; see Robert N. Bellah, *Tokugawa Religion* (New York, 1957).

³⁵ Carl L. Becker, *The Heavenly City of the Eighteenth-Century Philosophers* (New Haven, 1932).

³⁶ Cf. Thut and Adams, *Educational Patterns*, p. 113: “In the end, Frenchmen committed themselves to the ideas derived from humanism, rather than from Roman Catholic or Protestant theologies, a development which had profound educational consequences.”

tegration was a potent force in Germany and perhaps France, but largely absent in England and the United States. Occasionally England's laissez-faire philosophy is used to explain its lag in educational growth relative to other countries in northwestern Europe such as Germany, but the United States, which also lacked a national education policy, clearly calls this view into question. The factor that sets the English off most clearly from both Germany and the United States is the differential nature of Protestantism—the much larger representation in the latter countries of what in England would be called non-conformist religions, religions in the tradition of Calvin and Luther.³⁷

Earlier, in touching on the question of incentives for learning, I suggested that the expansion of formal schooling often signalled a positive shift in the incentive structure. The reasoning underlying this should now be clear. A major commitment to mass education is frequently symptomatic of a major shift in political power and associated ideology in a direction conducive to greater upward mobility for a wider segment of the population. This is not to imply that it signals complete democratization of opportunity, but it often represents a sizable break with conditions of the past. From this point of view the absence of mass education systems for so long in so many countries of the world is indicative of a double impediment to the spread of the technology underlying modern economic growth: limited incentives as well as limited aptitudes in the population generally.

Major advances in mass education are thus likely to signal sizable changes both in incentive structures and aptitudes favorable to modern economic growth. At the same time they are symptomatic of powerful new political and ideological forces at work in the cultures of the various countries. The educational system is therefore a key link between modern economic growth, on the one hand, and a society's culture, on the other; study of the evolution of mass education provides an important clue as to when the net balance of the principal cultural forces in a society shifts in a direction favorable to economic growth.

Some may object that the study of educational systems and the forces that shape them leads away from the traditional concerns of *economic his-*

³⁷ The leading role of non-conformists in the British industrial revolution is emphasized in Everett E. Hagen, *On the Theory of Social Change* (Homewood, Ill., 1962), chap. 13. Valuable discussions of early American education growth are Lawrence A. Cremin, *American Education: The Colonial Experience, 1607–1783* (New York, 1970); Bernard Bailyn, *Education in the Forming of American Society* (New York, 1960); Albert Fishlow, "The American Common School Revival: Fact or Fancy?" in Henry Rosovsky, ed., *Industrialization in Two Systems: Essays in Honor of Alexander Gerschenkron* (New York, 1966). On England, see Marius B. Jansen and Lawrence Stone, "Education and Modernization in Japan and England," *Comparative Studies in Society and History*, 9 (Jan. 1967), 208–32; Stanley J. Curtis and M.E.A. Boulton, *An Introductory History of English Education since 1800* (London, 1977); Roger S. Schofield, "Dimensions of Illiteracy, 1750–1850," *Explorations in Economic History*, 10 (Summer 1973), 437–54; E. G. West, "Literacy and the Industrial Revolution," *Economic History Review*, 2nd ser., 24 (Aug. 1978), 369–83.

tory.³⁸ To this, one may reply that if this is what the problem demands, then traditional orientations have to go. In a broader sense, however, it can be argued that such study is, in fact, a return to traditional economic history, to economic history in the spirit of scholars like Marx, Sombart, Weber, and Tawney.

IV

The intention of the government is within the shortest possible time to uplift the social conditions of the [Sakuddei]. But of course without shocks, this you can know for sure, without shocks, and bit by bit bringing them into contact with the general development of the Indonesian society. We want to bring them up in the state that they can understand us you know. . . . that what is health for, [sic] what hygiene for, what is a school for . . . just the elementary conditions that I think is standard for every normal society in this modern world.

Harun Zain, Governor of West Sumatra³⁹

Peking Paper Says Getting Rich Is Now an Accepted Socialist Goal.

International Herald Tribune, Jan. 2, 1980, p. 3

So far I have speculated about the spread of modern economic growth in the past. But what of the future? Will modern economic growth and its underlying technology continue to spread? Will the majority of the world's population in Asia, Africa, and Latin America be joining before long the minority? The answer suggested by my reasoning and by contemporary experience is yes. Since World War II growth of mass education has become a widespread phenomenon in the Third World, as is demonstrated by Figure 1. And in this period rates of economic growth have surged sharply upward in many Third World countries.⁴⁰ The diffusion of modern economic growth throughout the remainder of the world is already well under way. My guess is that once the developing countries have completed their demographic transitions—in many cases, probably by the end of this century—their long-term per capita growth rates will be at least as high as those that the developed countries have so far experi-

³⁸ Note, however, the numerous references above to recent economic history research on education. Gallman's recent presidential address also argues for a merger of the new social and economic history; Davis's, of the new political and economic history; see Robert E. Gallman, "Some Notes on the New Social History," this JOURNAL, 37 (March 1977), 3–12; and Lance E. Davis, "It's a Long, Long Road to Tipperary, or Reflections on Organized Violence, Protection Rates, and Related Topics: The New Political History," this JOURNAL, 40 (March 1980), 1–16.

³⁹ From *The Sakuddei* television program as it appeared in the Odyssey series, produced and copyrighted by Public Broadcasting Associates, Inc., 1980. The original *Sakuddei* program was produced and copyrighted by Granada Television. The Sakuddei is a tribal clan living on an island off the west coast of Sumatra.

⁴⁰ David Morawetz, *Twenty-Five Years of Economic Development, 1950 to 1975* (Washington, D.C., 1977); Robert Summers, Irving B. Kravis, and Alan Heston, "International Comparison of Real Product and Its Composition: 1950–77," *The Review of Income and Wealth*, Series 26, No. 1 (March 1980); Everett E. Hagen and Oli Hawrylyshyn, "Analysis of World Income and Growth, 1955–1965," *Economic Development and Cultural Change*, 18, no. 1, part II (Oct. 1969).

enced, and that another century, in addition to the two so far experienced, will largely complete the transition to modern economic technology and organization throughout the world, though sizable international income differences may persist. This reasoning assumes, of course, that the international political structure will be able to withstand the new strains caused by the shifts in political power arising from the further spread of economic development.

If this comes to pass, what will the world be like when the triumph of this new epoch of economic history is complete? Will "the economic problem" have been put to rest and humanity turn to more important pursuits, as John Stuart Mill once contemplated? Will humanity have made the great leap into freedom that Marx envisaged?

To answer this requires, at a minimum, a projection of both human wants and economic technology. Will material wants continue to grow, and, if so, will they be supported by an ever-expanding technology? Or will we wind down into a stationary state of comfortable satisfaction with material need banished from the earth?

The answers to these questions are, I believe, already at hand. The evidence is that there is no satiation of human wants; rather, that the mechanism of economic growth causes the luxuries of one generation to become the necessities of the next, and thus leads to ever higher material aspirations.⁴¹ Nor is there reason to expect a declining rate of technical progress, because the march of science, on which technology ultimately rests, is steadily onward.⁴² While it would be pleasant to envisage a world free from the pressure of material want, a more realistic projection based on current evidence for the now developed countries is of a world caught on a "hedonic treadmill," a world in which generation after generation thinks it needs only another 10 or 20 percent more income to be perfectly happy. This will be, moreover, a monocultural world, East and West, capitalist and communist, for the personality traits that are formed in the process of modern economic growth ultimately prevail over cultural and ideological differences—in short, the hedonic treadmill becomes universal.

Evidence of growing cultural homogeneity in other respects is clearly apparent in recent research. I quote a summary of recent findings in sociology:

Western scientific-technical concepts of reality have penetrated almost everywhere. Rapidly expanding education systems universally promote science, technology, and mathematics, implicitly advancing a conception of natural reality as law-like, strictly causally ordered, and manipulable. This conception is also built into institutions of scientific research, national planning, and national industrialization.

⁴¹ Richard A. Easterlin, "Does Economic Growth Improve the Human Lot? Some Empirical Evidence," *Nations and Households in Economic Growth: Essays in Honor of Moses Abramovitz* (New York, 1974); Richard A. Easterlin, "Does Money Buy Happiness?" *The Public Interest*, no. 30 (Winter 1973).

⁴² Derek J. de Solla Price, *Science since Babylon* (New Haven, 1961), chap. 5.

Descriptions of transcendental authority also become more uniform. Universalistic and unitary conceptions of God (or equivalently, of history) prevail. Indigenous, localized religious systems applying only to particular groups die out or are transformed to resemble more widespread systems.

Finally, descriptions of the nature of man and society converge. Individuals are seen as both malleable and as possessing many economic and social rights that are remarkably similar, in the abstract, from country to country. Obligations to maintain economic progress and social justice are defined in uniform terms. To a remarkable degree, every sort of state defines for itself uniform long-run economic and social goals.⁴³

This, then, is the future to which the epoch of modern economic growth is leading us: a world in which ever-growing abundance is always outpaced by material aspirations, a world of increasing cultural uniformity.

At some point, we may look back and ask what produced this world—how we got where we are. Such inquiry will show, I believe, that the proximate roots of the epoch of modern economic growth lie in the growth of science and diffusion of modern education. In a more fundamental sense, however, it will show that the source of this epoch is the secular, rationalistic, and materialistic trend of intellectual thought that evolved from the Renaissance and Reformation—that in rejecting the authority of the medieval Church, humanity ultimately took up a new “religion of knowledge,” whose churches are the schools and universities of the world, whose priests are its teachers, and whose creed is belief in science and the power of rational inquiry, and in the ultimate capacity of humanity to shape its own destiny. The irony is that in this last respect the lesson of history is otherwise: that there is no choice. The epoch of modern economic growth—a world of nations blindly developing—is itself the proof of this.

⁴³ John W. Meyer, John Boli-Bennett, and Christopher Chase-Dunn, “Convergence and Divergence in Development,” in Alex Inkeles, ed., *Annual Review of Sociology*, 1 (Palo Alto, 1975), p. 228.

APPENDIX TABLE I
ESTIMATED PRIMARY SCHOOL ENROLLMENT RATE
BY COUNTRY, 1830–1975
(per 10,000 population)

Country	Year													
	1830	1840	1850	1860	1870	1882	1890	1900	1910	1920	1930	1950	1960	1975
USA	1500		1800		1702	1908	1985	1969	1828					
UK	900		1045			1107	1261	1407	1648					
France	700	846	930	930	1125	1382	1450	1412	1414					
Germany	1700		1600	1559		1547	1642	1576	1570					
Italy	1830	1850	1860	1870	1882	1890	1900	1910	1920	1930	1939			
Spain	300		463	611	681	874	881	927	1113	1056	1313			
	400	537	663	851	1049	1058	1038	1026	1232	1535				
Rumania	1870	1882	1890	1900	1910	1920	1930	1939						
Yugoslavia	214	261	467	617	839	642	1307	1581						
USSR	98	303	300	420	512	674	772	888						
		133	231	348	395	417	734	1873						
Argentina	1870	1882	1890	1900	1910	1920	1930	1939	1950	1960	1975			
Mexico		511	709	808	944	1356	1172	1417	1286	1339	1399			
Brazil		457	487	544	563	456	1074	1314	1072	1460	1905			
Burma	119	207	218	258	271	455	618	854	979	1087	1866			
India							206	316	427		731	1127		
Indonesia			94	107	147	192	343	279	513	854	1082			
			57	62	96	161	267	338	613	964	1345			

	1882	1890	1900	1910	1920	1930	1939	1950	1960	1975
Japan	722	772	984	1240	1508	1550	1695			
Philippines			188	970	1038	936	1267	1891		
Thailand				9	179	552	939	1490		
Egypt	4	264	215	171	171	269	687	662	1038	1107
Iran			3	6	10	82	213	457	701	1353
Turkey					201	318	464	776	1026	1376
<hr/>										
China				1910	1920	1930	1939	1950	1960	1975
Korea					115	222	329	861	948	
Nigeria				27	72	246	501	1151		
Ethiopia				12	176	191	103	399	479	820
								49	81	366

Source: A: Arthur S. Banks, *Cross-Polity Time Series Data* (Cambridge, 1971); B: *The Statesman's Yearbook 1883-1960* (London, 1883-1960); C: E. Levasseur, *L'Enseignement primaire dans les pays civilisés* (Paris, 1897); D: Richard A. Easterlin, "A Note on the Evidence of History," in C. Arnold Anderson and Mary Jean Bowman, eds., *Education and Economic Development* (Chicago, 1965), pp. 422-29; E: Andrew J. Grajdanzev, *Modern Korea* (New York, 1944); F: UNESCO, *Statistical Yearbook 1977* (Paris, 1978) and United Nations, *Demographic Yearbook 1977* (New York, 1978).

Source of data for 1975 is F; for all other dates A, except as follows: USA 1830, 1850-D; UK 1830, 1850-D; France 1830-D, 1840-1860-C; Germany 1930, 1850-D, 1860-C; Italy 1830-D, 1860, 1870-C; Spain 1830-D, 1850-C; Rumania 1870, 1890-C; USSR 1890-C; Argentina 1882-C; Burma 1930-1950-B; India 1890-1930-B; Indonesia 1890-1939-B; Philippines 1900-1939-B; Thailand 1910-1939-B; Egypt 1882-1939-B; Iran 1900-1939-B; Korea 1910-1939-E; Nigeria 1910-1950-B.